

DATE: August 18, 2008

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THROUGH: Dennis Miller, REAC Program Manager

FROM: Larry A. Lyons, REAC Biology Group, Task Leader
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SUBJECT: SITE VISIT AND GEOPHYSICAL SURVEY: PRE-ASSESSMENT OF PUBLIC WORKS (OBRAS PUBLICAS) SITE, GUANICA, PUERTO RICO. WORK ASSIGNMENT #0-358 - TRIP REPORT

At the request of the United States Environmental Protection Agency (EPA)/Environmental Response Team (ERT) and EPA Region II, a site visit and a preliminary geological survey of a portion of a site located in Guanica, Puerto Rico was performed on August 7, 2008. Guanica is on the southern coast of Puerto Rico, approximately 29 miles west of the city of Ponce.

This two to five-acre site, located within the residential area of Guanica, is expected to be developed into a shopping center. Although there are no buildings on the site, there are several concrete slabs. Along with the concrete slabs, the site has cleared and grassy areas, mounds of debris, and areas that are heavily vegetated with shrubs and trees. Drums and other debris are rumored to be buried at this site. A school is adjacent to the site along the western perimeter. Figure 1 provides an overview of the site and shows the two areas (Survey Areas 1 and 2) for which the preliminary geophysical survey was performed.

The objective of the preliminary geophysical survey of Survey Areas 1 and 2 was to determine whether anomalies indicative of buried metal are in these areas. A time-domain electromagnetic (TDEM) survey, employing a Geonics® EM61 MK2 (EM-61) instrument, was conducted to locate buried metal. A ground penetrating radar (GPR) system was used to confirm and refine the locations of anomalies identified during the TDEM survey. The EM-61 is a time-domain metal detector that induces a magnetic field in the earth and measures the secondary magnetic field that is created. Measurements are made over different time gates providing better discrimination of the materials based on the decay of their secondary magnetic field.

Table 1 provides the Global Positioning System (GPS) survey points for Survey Areas 1 and 2. The survey was conducted over two grids with lines spaced three feet apart and station locations determined by the odometer connected to the wheel assembly of the instrument. The survey grid was set up using measuring tapes that establish survey transects perpendicular to a baseline. Survey Area 1 was situated along the western perimeter adjacent to the school. The eastern and western extents of Survey Area 1 were limited by thick vegetation. Survey Area 2 was perpendicular to the first area and ran westward paralleling the north side of the school. The grid was laid out in a similar fashion as the first area; however, this survey area was along a narrow path and only a few transects could be run with the EM-61.

Figure 2 provides the EM61 differential response for Survey Areas 1 and 2. Survey Area 1 has an irregular shape due to the accessibility limitations of the survey equipment resulting from high vegetation. The narrow area along the southern end of Survey Area 1 had a low response indicating little to no buried metal. On the southern end of this area, there was an EM-61 response consistent with a buried utility line. The northern end of Survey Area 1, which is somewhat rectangular, has a higher differential response indicating significant levels of buried metal. Two areas, indicated on Figure 2, had a response consistent with a high concentration of buried metal. These two anomalies are potentially buried drums.

Survey Area 2 had responses on both ends that are indicative of small to medium concentrations of metal that are unlikely to represent large items such as drums. The center of this survey area had very low responses indicative of little to no buried metal present (Figure 2).

Figure 3 shows four profiles collected with the GPR system within Survey Area 1. Figure 1 indicates the location of the four profiles where Profile 1, Profile 2 and Profile 4 were collected in a north-south direction, and Profile 3 was

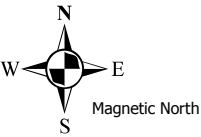
collected in an east-west direction. These four profiles are located where the largest anomalies were observed from the EM-61 responses provided in Figure 2. The anomalous areas identified in Figure 3 are chaotic regions in the profiles from the radar waves reflecting off surfaces that are not parallel to the surface or to each other. Profile 2 and Profile 3 appear to have disturbed areas in the surface above the anomalies. These anomalies are also large enough to be caused by metal objects several feet long.

A work assignment (WA) has been received for a more comprehensive assessment of the site. This WA incorporates a geophysical survey of the entire site to assess the potential of metal buried, soil sampling, and if geophysical anomalies are identified, soil gas sampling. Analyses for the soil samples will include target analyte list (TAL) for metals, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), pesticides and polychlorinated biphenyls (PCBs).

cc. Raj Singhvi, U.S. EPA/ERT
Alan M. Humphrey, U.S. EPA/ERT

Table 1
GPS Based Coordinates of Preliminary Assessment Area
Coordinates in NAD 1983, Puerto Rico/Virgin Islands State Plane in Feet
Public Works (Obras Publicas),
Guanica, Puerto Rico

Survey Area 1			
Location	Easting	Northing	Survey Grid Point
Point 1	491982.5	706940.8	0 and 35
Point 2	492051.3	706934.1	69 and 35
Point 3	491974.0	706864.9	0 and 112
Point 4	492041.0	706858.3	69 and 112
Point 5	491965.0	706788.2	0 and 189
Point 6	491978.7	706786.1	12 and 189
Point 7	491959.3	706719.2	0 and 258
Point 8	491970.9	706717.0	12 and 258
Survey Area 2			
Point 9	491991.5	706978.5	-3 and 0
Point 10	491840.1	706997.7	-3 and 150
Point 11	491838.6	706992.4	6 and 150
Site Landmarks			
Point 12	492024.0	706848.4	Utility Pole
Point 13	492031.0	706910.7	Stake (rebar)



Legend

Geophysical Survey Points

Geophysical Survey Area

Site Driveway

GPR Profile Line

Road

Map created using Guanica othophotography, road map, site survey GPS data.
GPS data collected in Lat., Log., decimal degree. WGS 84

Map Creation Date: 15 Aug 2008

Coordinate system: Puerto Rico State Plane
Zone (or FIPS code): FIPS 5200
Datum (or other reference): NAD83
Units (of original data): Feet

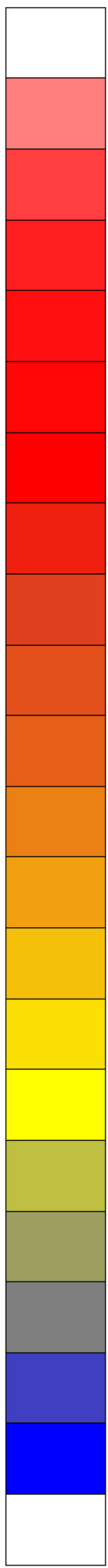
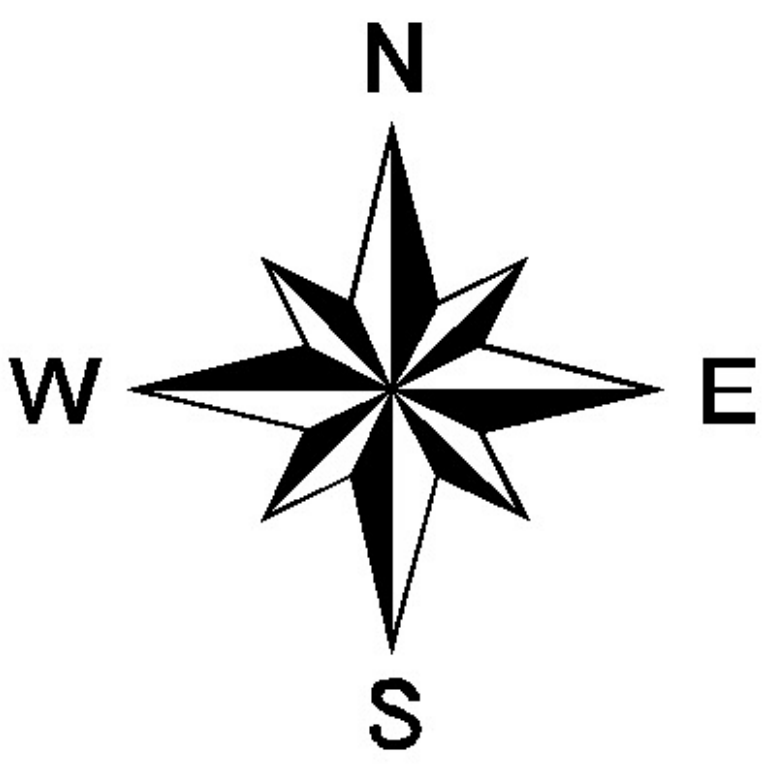
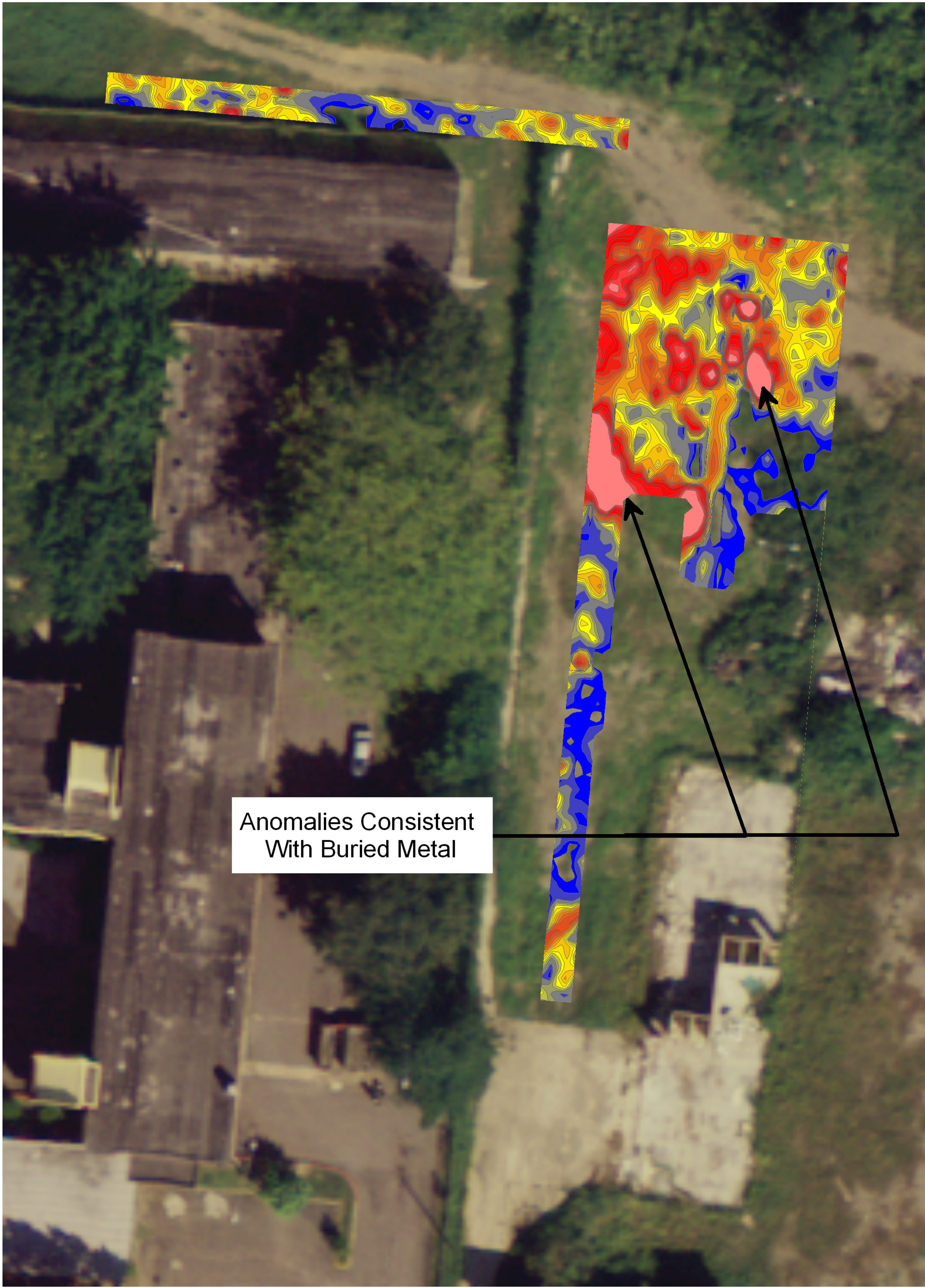


D R A F T

Data: g:\arcviewprojects\reac4\00-358
MXD file: g:\arcinfoprojects\reac4\EAC00358_SiteName\358_Site_Overview_fxrev001
Revision Number: 001

U.S EPA Environmental Response Team
Response Engineering and Analytical Contract
EP-C-04-032
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Figure 1
Site Overview
Public Works (Obras Publicas)
Guanica, Puerto Rico
August 2008



Metallic Response

Non-metallic Response

Anomalies Consistent
With Buried Metal

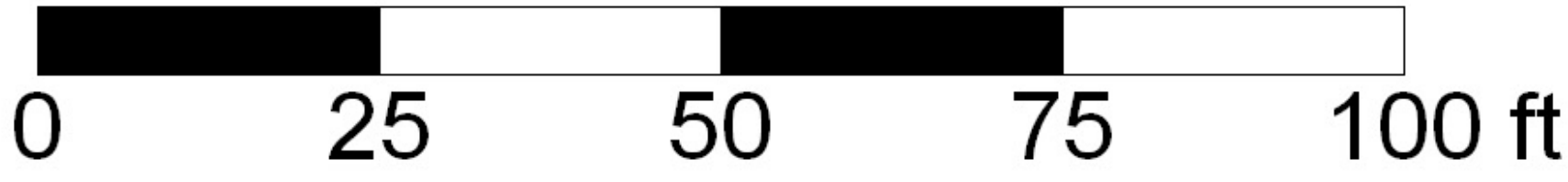
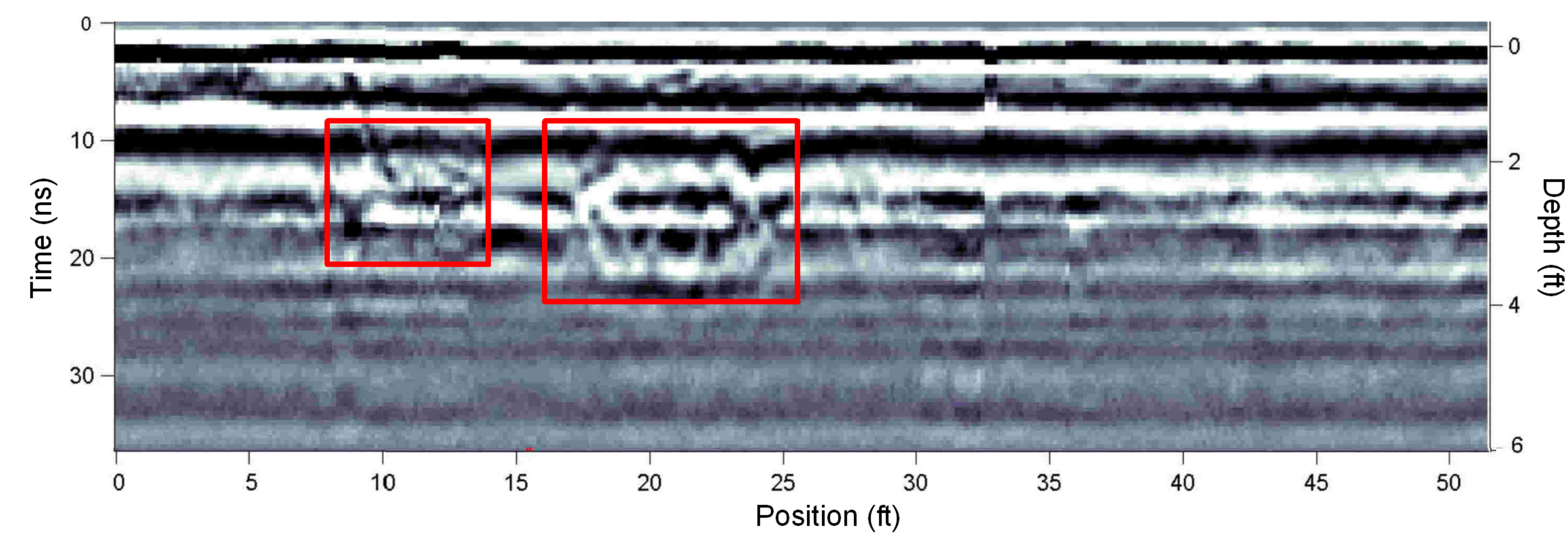


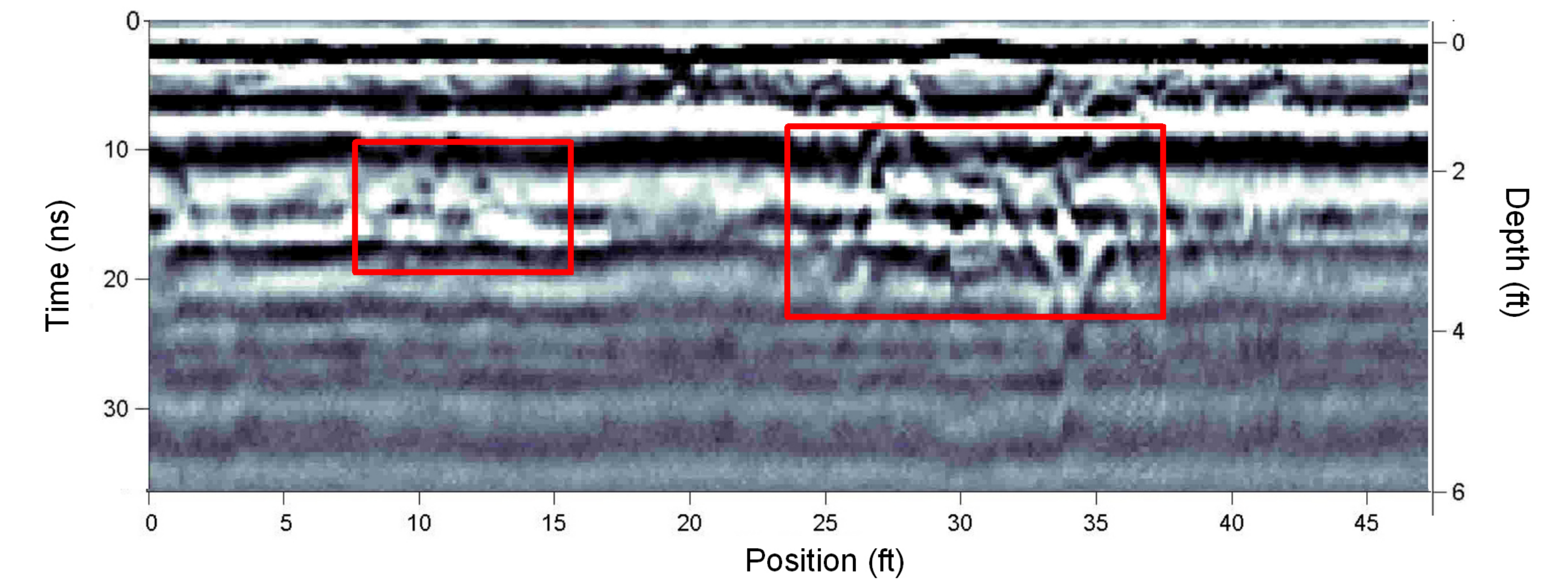
Figure 2
Peak EM-61 Differential Response Map
Guanica Public Works
Guanica, Puerto Rico

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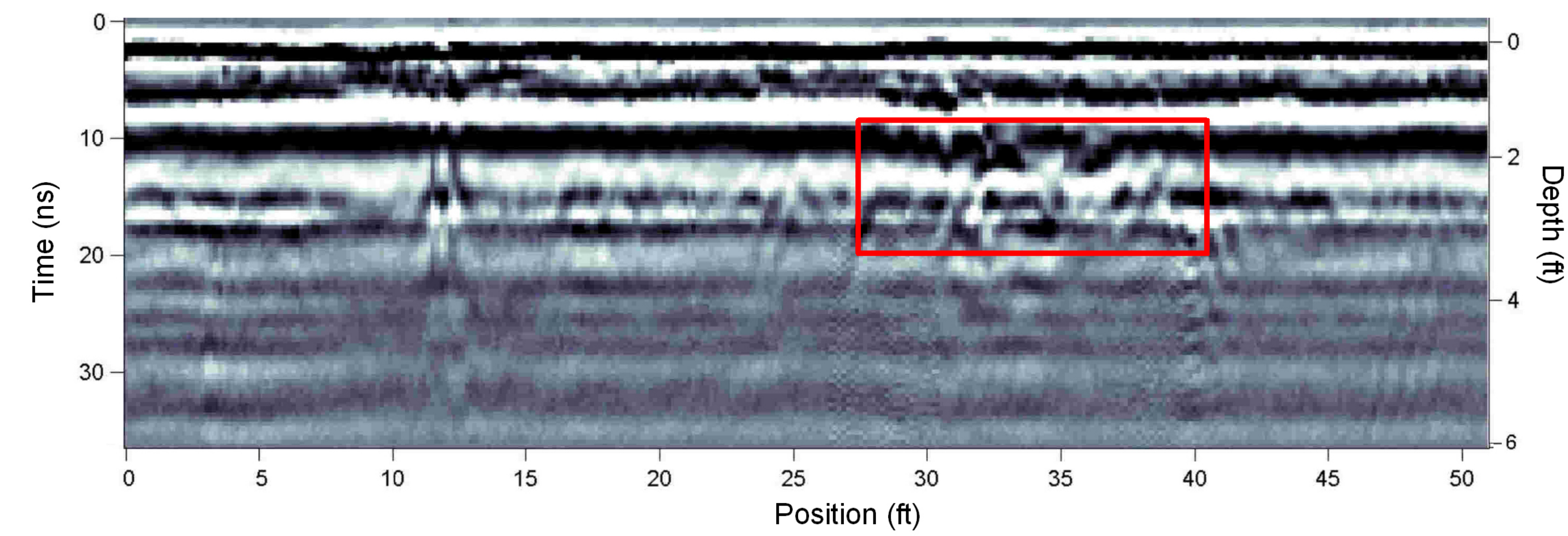
Profile 1



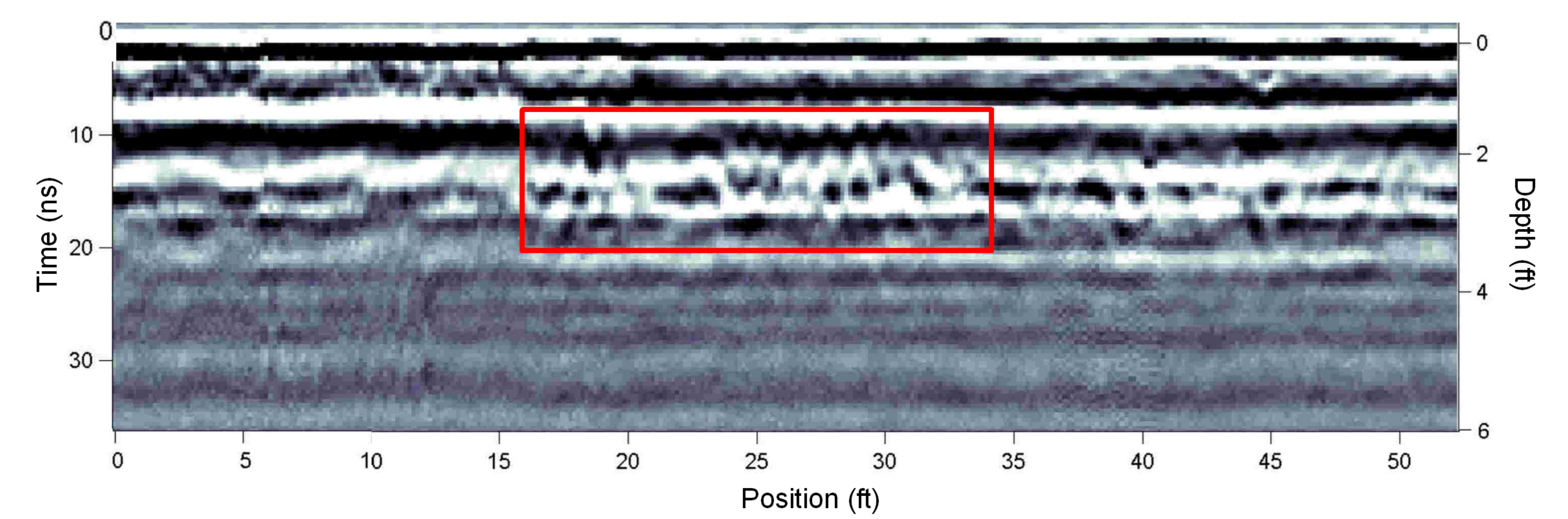
Profile 2



Profile 3



Profile 4



Anomalous reflections possibly
from buried metal

Figure 3
Ground Penetrating Radar Profiles
Guanica Public Works
Guanica, Puerto Rico

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